IONIZING RADIATION (IR)

INFORMATION FOR HEALTH CARE PROVIDERS

WHAT IS IONIZING RADIATION?

Ionizing radiation (IR) is high-energy radiation. Exposure to high doses of IR may cause adverse health effects. Sources of IR exposure during military service include:

- Proximity to radioactive material, such as, calibration and measurement sources, nuclear weapons, and depleted uranium as fumes from fires or as shrapnel from an explosion
- Medical treatment using high dose radiation

VETERANS POTENTIALLY AFFECTED

Veterans who served in one or more of the following situations or circumstances may have been exposed to radiation.

- **Radiation-risk activity (includes "Atomic Veterans")**
  Exposure to above-ground nuclear weapons testing and/or fallout radiation during the American occupation of Hiroshima and Nagasaki
- **Fukushima nuclear accident**
  Exposure to very low doses of radiation following the nuclear accident in Japan from March 12 to May 11, 2011
- **Military occupational exposure**
  Worked specific various military occupations, such as nuclear weapons technician or x-ray technologist, including routine and usually safe exposure to radiation
- **Depleted uranium**
  Proximity to an explosion where shrapnel or fumes containing depleted uranium, used in tank armor and some bullets, is embedded in the body or inhaled
- **LORAN radiation**
  Exposure to X-ray radiation from high voltage vacuum tubes used at LORAN (Long Range Navigation) stations from 1942 to 2010 by the U.S. Coast Guard
- **McMurdo Station, Antarctica nuclear power plant**
  Exposure to radiation due to a nuclear plant leak at the U.S. Navy's McMurdo Station in Antarctica from 1964 to 1973
- **Nasopharyngeal (nose and throat) radium irradiation treatments**
  Radiation treatment received by certain pilots, submariners, divers, and others during service from 1940 to the mid-1960s to prevent ear damage from pressure changes
- **Radiation therapy**
  Exposure to radiation during the treatment of disease, most commonly cancer
- **Radiological cleanup of Enewetak Atoll**
  Radiological cleanup of the nuclear testing site at Enewetak Atoll, from January 1, 1977, through December 31, 1980
- **U.S. Air force plutonium clean-up mission, Palomares, Spain**
  Cleanup of plutonium following an in-air refueling accident involving an Air Force B-52 bomber carrying nuclear weapons, near Palomares, Spain, from January 17, 1966, through March 31, 1967
- **Thule Air Force Base in Greenland**
  Response to the fire onboard, and crash of, an Air Force B-52 bomber carrying nuclear weapons near Thule Air Force Base in Greenland from January 21, 1968, to September 25, 1968

WHAT DISEASES AND ILLNESSES ARE LINKED TO IR EXPOSURE?

For most military exposures, radiation doses are well below levels associated with adverse medical conditions. Occurrence of disease is dependent on the amount of radiation exposure and the time elapsed between exposure and the development of disease.

VA recognizes that the following diseases may be caused by exposure to IR, but are not considered presumptive diseases:

- All cancers
- Non-malignant thyroid nodular disease
- Posterior subcapsular cataracts
- Non-malignant tumors of the brain and central nervous system

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Some Veterans affected by IR are referred to as "Atomic Veterans." These Veterans participated in one or more "radiation risk activity", such as, above-ground nuclear tests during their military service between 1945 and 1962; or were part of the U.S. military occupation forces in and around Hiroshima or Nagasaki, Japan, before 1946.

For Veterans exposed as part of a "radiation risk activity," VA refers to certain cancers linked to IR exposure as presumptive diseases. Veterans involved in "radiation risk activity" do not have to prove an association between their illness and military service.

Presumptive diseases related to IR include:

- Cancers of the bile ducts, bone, brain, breast, colon, esophagus, gall bladder, liver (primary site, but not if cirrhosis or hepatitis B is indicated), lung (including bronchiolo-alveolar cancer), pancreas, pharynx, ovary, salivary gland, small intestine, stomach, thyroid, urinary tract (kidney/renal, pelvis, urinary bladder, and urethra)
- Leukemia (except chronic lymphocytic leukemia)
- Lymphomas (except Hodgkin's disease)
- Multiple myeloma (cancer of plasma cells)

WHAT YOU CAN DO

To help conduct the examination, engage Veterans by asking questions such as:

1. When and where were you exposed to radiation?
2. How were you exposed? Possible responses might include proximity to sources, inhalation, ingestion, or transdermal exposure.
3. What precautions did you take at the time?Possible actions might include avoidance, personal protective equipment, and/or treatment.
4. Was your exposure measured by wearing a dosimeter or some other form of measurement (in vivo or in vitro bioassay)?
5. Why are you concerned about this exposure?

SUGGESTIONS ON HOW PROVIDERS EXPLAIN IR-RELATED HEALTH CONDITIONS IN PLAIN LANGUAGE

When explaining IR-related health conditions to your patients use terms and descriptions that are plain language. Radiation exposure causes specific, well documented, diagnosable disease. Specialists are available in VHA to assist you (nuclear medicine, radiation oncology, radiology, and radiation safety). The effects of radiation exposure are directly related to dose; therefore, it is important to offer the Veteran proper perspective as to radiation dose and the health condition for which they are seeking care (see **www.epa.gov/radiation/understand/health_effects.html**). Then, work with your patient to develop a care plan:

- Perform a broad health screen
- Consider current or latent effects of the exposure based on routine lab results
- Develop treatment options
- Conduct follow up appointments
- Encourage healthy living

For more available resources visit **www.publichealth.va.gov/exposures/radiation/providers/index.asp**.

SUPPORT AVAILABLE TO VETERANS

Veterans may be eligible for free or low-cost VA health care. In addition, Veterans and their families may be eligible for disability compensation and survivors' benefits. To be considered for disability compensation you must file a claim. VA will check military records to verify exposure to the claimed environmental hazard or for qualifying military service. Familiarize yourself with available VA benefits at **www.publichealth.va.gov/exposures/benefits/index.asp**.

VA offers specialized programs to address health issues related to deployment. Patients enrolled in VA health care can take advantage of these services as part of their overall health care plan:

- **VA Environmental Health Clinics**: Locations at VA health care facilities nationwide provide specialized knowledge about potential environmental exposures and conduct exams for the Ionizing Radiation registry. A list of VA Environmental Health Coordinators is available online at **www.publichealth.va.gov/exposures/coordinators.asp**.
- **War Related Illness and Injury Study Center (WRIISC)**: WRIISC's three locations nationwide provide medical evaluations and treatment plans for chronic, difficult-to-diagnose conditions related to deployment. Visit **www.warrelatedillness.va.gov/** for more information.

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